IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF PENNSYLVANIA

UNITED STATES OF AMERICA v. YU XUE, et al., Defendants.	CRIMINAL ACTION NO. 16-22

OPINION

Slomsky, J. **September 22, 2020**

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I. INTRODUCTION

This case involves a serious offense: theft of trade secrets from a large corporation that manufactures products for the benefit of humankind. The company invests a considerable amount of money to create products and have them patented. It does not want its proprietary information misappropriated. But the issue now before the Court is not whether trade secrets were stolen; that issue has already been resolved. Defendants Yu Xue and Tao Li (together "Defendants") pled guilty to conspiring to commit the thefts. Instead, the unique challenge posed here is to determine the dollar amount of loss to the victim, GlaxoSmithKline LLC ("GSK"), a global healthcare and pharmaceutical research company, under provisions of the United States Sentencing Guidelines.[1]

The parties in this case have submitted wildly varying loss figures. The Government, relying on a theory of "intended loss," submits the loss is greater than $550 million. Defendants assert that the loss in this case is $0.

The disparity arises from competing interpretations of Section 2B1.1(b)(1) of the United States Sentencing Guidelines, its Application Notes, and related case law. The Government interprets the Guidelines to permit the Court in this case to use the cost of developing the stolen information and its fair market value as the intended loss figure. In contrast, Defendants

[1] Under the federal Sentencing Guidelines, a total loss in dollars is used to calculate an Offense Level, which influences the range of imprisonment recommended by the Guidelines. Although the Guidelines are only advisory and are only one factor among many to be considered by a court in fashioning an appropriate sentence, the amount of loss to the victim still has an impact on the sentence because the higher the aggregate loss, the greater the range of imprisonment recommended.

interpret the Guidelines to require, as a prerequisite to any intended loss valuation, that the Government prove that they purposefully sought to inflict the loss amount on the victim, GSK.

Although the outcome here may seem discomforting, reasoned application of the law mandates that the loss amount under the Sentencing Guidelines is $0. To establish intended loss, the Government must show that its proffered figure reflects the loss Defendants purposefully intended the victim to suffer. The Government made no such showing here. Instead, the Government attempted to prove only the development cost of the stolen information and its fair market value, not the loss Defendants intended GSK to suffer.[2] And while the Court may draw reasonable inferences to find intended harm, the Government provided no facts from which such inferences could reasonably be drawn to support their theory on the loss amount. Thus, because the Court is bound to follow the law applicable under the Sentencing Guidelines, the loss in this case is $0.

II. BACKGROUND

A. Factual and Procedural History

On December 29, 2015, the Government filed a Criminal Complaint against Defendants and three other alleged co-conspirators, charging them with conspiracy to commit wire fraud in violation of 18 U.S.C. § 1349. (Doc. No. 1.) That same day, arrest warrants were issued by a

[2] The Government also argues, in a cursory fashion, that Defendants' "intended gain" is another way to estimate loss and another way to decide whether Defendants purposefully intended to inflict harm. In Application Note 3(B) to Section 2B1.1 of the federal Sentencing Guidelines, "intended gain" is not mentioned at all, only actual gain, and actual gain is only to be considered if the victim suffered an actual loss, which is not the case here. U.S.S.G. § 2B1.1, app. n.3(B). Although the notion of "intended gain" is not part of Section 2B1.1 of the Sentencing Guidelines, it has been referred to in court decisions, albeit ones focused on the reasonable inferences a court may make when determining if a defendant had the requisite intent for an intended loss Offense Level enhancement. The Government's argument on "intended gain" is discussed more fully, infra.

United States Magistrate Judge. On January 5, 2016, Defendants were arrested, and on January 20, 2016, a grand jury returned a forty-three count Indictment charging them and other alleged co-conspirators with conspiracy to commit wire fraud, conspiracy to steal trade secrets, conspiracy to commit money laundering, and substantive counts of wire fraud and theft of trade secrets. (Doc. No. 24.)

On May 24, 2017, a forty-five count Superseding Indictment was returned against Defendants and the alleged co-conspirators. (Doc. No. 125.) Defendants were charged with:

- Conspiracy to commit wire fraud, in violation of 18 U.S.C. § 1349 (Count 1);
- Conspiracy to steal trade secrets, in violation of 18 U.S.C. § 1832(a)(5) (Count 2);
- Conspiracy to commit money laundering, in violation of 18 U.S.C. § 1956(h) (Count 3);
- Wire fraud, in violation of 18 U.S.C. § 1343 (Counts 4-19); and
- Theft of trade secrets, in violation of 18 U.S.C. § 1832(a) (Counts 22, 28, 31, 34, 37).

In addition, Defendant Xue was named as a defendant in the following counts:

- Theft of trade secrets, in violation of 18 U.S.C. § 1832(a) (Counts 20-21, 26-27, 29-30, 32-33, 35-36, 38-43, 45).

Defendant Li was named as a defendant in another count:

- Theft of trade secrets, in violation of 18 U.S.C. § 1832(a) (Count 44).

(Id.)

The Superseding Indictment alleges that from 2010 to 2016 Defendants conspired to steal confidential and trade secret[3] information from GSK. (Id. at 1.) GSK specializes in the research, development, and production of biopharmaceutical products aimed at fighting cancer and other diseases. (Id. at 1-2.) From June 2006 to January 2016, Defendant Yu Xue was employed as a research scientist at a GSK research facility in Upper Merion, Pennsylvania. (Id. at 4.) She worked on various biopharmaceutical products, including HER3 monoclonal antibody design,[4] and had access to a multitude of GSK trade secrets and confidential information. (Id. at 5, 6.) The Superseding Indictment alleges that, while working for GSK,

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[3] The term "trade secret" is defined in 18 U.S.C. § 1839(3):

> (3) the term "trade secret" means all forms and types of financial, business, scientific, technical, economic, or engineering information, including patterns, plans, compilations, program devices, formulas, designs, prototypes, methods, techniques, processes, procedures, programs, or codes, whether tangible or intangible, and whether or how stored, compiled, or memorialized physically, electronically, graphically, photographically, or in writing if –
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> > (A) the owner thereof has taken reasonable measures to keep such information secret; and
> >
> > (B) the information derives independent economic value, actual or potential, from not being generally known to, and not being readily ascertainable through proper means by, another person who can obtain economic value from the disclosure or use of the information.

18 U.S.C. § 1839(3)(A)-(B).

[4] In certain forms of cancer, HER3 receptors on human body cells are overexpressed, i.e., the cells contain too many of these receptors, which contributes to the development of the cancer. HER3 antibodies are antibodies designed to bind to or otherwise impact the overexpressed HER3 receptor cells in the body to eliminate or retard the cancer. (See Doc. No. 125 at 2.)

Defendant Xue stole a number of documents containing confidential and trade secret information by emailing them to her personal account and then forwarding the documents to her co-defendants. (Id.) She also allegedly downloaded documents containing confidential and trade secret information onto a thumb drive and distributed this information to her co-defendants. (Id.) These actions contradicted clear company policy prohibiting employees from copying, distributing, and storing GSK information on personal devices, and using company information for personal and business reasons unrelated to GSK. (Id. at 3.)

The Superseding Indictment further explains that on July 16, 2012, Defendant Xue, Defendant Li, and another co-defendant created a corporation in the United States named Renopharma Inc., and two other offshore companies in China (referred to collectively as "Renopharma"). (Id. at 8.) Defendants advertised Renopharma as a research and development company that "specialized in providing products and services to support drug discovery programs at pharmaceutical and biotech companies." (Id.) But according to the Government, in reality, Defendants planned to use Renopharma to market, sell, and profit from the trade secret information described in the stolen GSK documents. (Id.)

The Superseding Indictment lists thirty-six different misappropriated documents that allegedly contain trade secrets or confidential information. (See Doc. No. 125 at 10-23.) The documents are in various forms, including PowerPoint presentations, internal GSK reports, and internal GSK memoranda. (See id.) Their content also varied, and included information about HER3 monoclonal antibodies; three GSK development platforms, namely, the (1) a monoclonal antibody platform ("mAb"); (2) a domain antibody platform ("dAb"); and (3) an antibody drug

conjugate platform ("ADC"); and details about specific GSK products under development, including Investigational New Drugs[5] ("INDs").[6] (See id.; see also Doc. No. 271 at 10.)

[5] Investigational New Drugs, or INDs, are applications that a company presents to the Food and Drug Administration ("FDA") before starting a new clinical trial. (Doc. No. 286 at 127.)

[6] The documents referred to in the Superseding Indictment as containing trade secrets and confidential information do not differentiate between information that is a trade secret and information that is confidential. (See Doc. No. 125 at 10-23.) To explain the difference, the Government submitted a thirty-two-page report authored by Dr. Chester Meyers, entitled, "GSK Trade Secrets in Superseding Indictment Documents." (Gov't Ex. Q.) The report identifies GSK trade secrets and their locations in thirteen documents listed in the Superseding Indictment. (See id.) The report then divides the trade secrets into five different categories. First, "Experimental Test Results," which include experimental results of GSK products, which apparently are of significant importance to GSK because they enable the company to prioritize product development. (See id. at 5.) Second, "Strategic Directions/Decisions," which include models and processes concerning how GSK prioritizes product development and implements processes and procedures based on its strategic approaches and goals. (Id. at 6.) Third, "Process Descriptions, Procedures," which include how GSK identifies, tests, understands, develops, and manufactures its products. (Id.) Fourth, "Bioanalytical Characterization, Methods, [and] Procedures," which include processes to develop, qualify, and validate potential GSK products. (Id.) Fifth, "Timelines/Schedules," which include projected launch dates for GSK's portfolio of products. (Id.) The report analyzes each of the thirteen documents in detail, explains the specific trade secret misappropriated, identifies the page or slide (for PowerPoint presentations) on which the trade secret is located, and describes why the trade secret is valuable to GSK. (See id. at 7-26.)

On August 31, 2018 and September 14, 2018, respectively, Defendants Xue and Li pled guilty to one count of conspiracy to steal trade secrets, in violation of 18 U.S.C. § 1832(a)(5).[7,8]

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[7] 18 U.S.C. § 1832(a) reads,

> (a) Whoever, with intent to convert a trade secret, that is related to a product or service used in or intended for use in interstate or foreign commerce, to the economic benefit of anyone other than the owner thereof, and intending or knowing that the offense will, injure any owner of that trade secret, knowingly—
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> (1) steals, or without authorization appropriates, takes, carries away, or conceals, or by fraud, artifice, or deception obtains such information;
>
> (2) without authorization copies, duplicates, sketches, draws, photographs, downloads, uploads, alters, destroys, photocopies, replicates, transmits, delivers, sends, mails, communicates, or conveys such information;
>
> (3) receives, buys, or possesses such information, knowing the same to have been stolen or appropriated, obtained, or converted without authorization;
>
> [. . .]; or
>
> (5) conspires with one or more other persons to commit any offense described in paragraphs (1) through (3), and one or more of such persons do any act to effect the object of the conspiracy,
>
> shall … be fined under this title or imprisoned not more than 10 years, or both.

18 U.S.C. § 1832(a)(1)-(3), (5).

[8] To violate 18 U.S.C. § 1832(a), a defendant need not know that the stolen information met the legal definition of a trade secret. Instead, all that is required is that a defendant knew the trade secret was "confidential information to which he had no claim." United States v. Krumrei, 258 F.3d 535, 537-38 (6th Cir. 2001); see also United States v. Roberts, No. 08-CR-175, 2009 U.S. Dist. LEXIS 121988, at *15 (E.D. Tenn. Nov. 17, 2009) ("a defendant must know that the information he or she seeks to steal is proprietary, meaning belonging

(Doc. Nos. 234, 235.) In exchange, the Government agreed to dismiss all other counts of the Superseding Indictment, including all substantive counts for theft of trade secrets, and to limit the sentence to no more than seven years for Defendant Li and no more than ten years for Defendant Xue. (Doc. Nos. 234, 235.) However, while Defendants agreed to resolve criminal liability through the plea agreements with limits on a sentence of imprisonment, they did not agree on the amount of loss, if any, to GSK under the federal Sentencing Guidelines. (Doc. Nos. 234, 235.) As noted, the Government contends that the loss applicable to Defendants is greater than $550 million. (Doc. No. 271 at 2.) Defendants dispute that figure and submit that the loss amount is $0. (Doc. Nos. 292 at 7.) Given the disparity, Defendants and the Government ceded to the Court the decision on the amount of loss. (Doc. Nos. 234, 235.)

A date for an evidentiary hearing on the issue of loss was scheduled. On April 29, 2019, prior to the hearing, the Government submitted a Memorandum on the loss calculation, contending that the loss amount for Sentencing Guideline purposes exceeds $550 million.[9] (Doc. No. 271.) As noted, the Government contends that under the Sentencing Guidelines, intended loss is calculated by using the fair market value of the stolen property and/or the cost of development. (Id. at 3.) The Government avers that its approach yields a loss amount above $550 million. (Id.)

The Government's Memorandum also previewed testimony and exhibits it was going to offer to support these findings. It explained that it planned to offer five witnesses to support

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to someone else who has an exclusive right to it, but does not have to know that it meets the statutory definition of a trade secret.").

[9] Defendants did not submit a pre-hearing memorandum on the loss amount.

the proposed loss valuation, including (1) FBI Special Agent Andrew Haugen; (2) Dr. Joseph Tarnowski, Senior Vice President of GSK; (3) Dr. Joseph Villafranca, an expert witness on the business aspects of the biopharmaceutical industry; (4) Dr. Chester Meyers, an expert on patent applications; and (5) Dana Trexler, an economic expert witness. In addition, the Government described documentary evidence it would rely on to support its loss valuation. Among other things, the Government averred that it has Renopharma marketing documents "estimat[ing] hundreds of millions of dollars in future profit . . . from the sale of [a stolen] HER3 candidate drug" (Id. at 6-7); an e-mail from Defendant Li soliciting investment in Renopharma and claiming that the company already had "several developed and validated humanized antibodies targeting a certain important target, which is ready for animal experiments" (Id. at 7); and Renopharma business plans showing Defendants valued the stolen information between $200 million and $2.2 billion and that Renopharma could be worth as much as $10 billion in ten years based on the growth of other successful emerging pharmaceutical ventures (Id. at 6-8).

B. Evidentiary Hearing on Loss

From April 30, 2019 to May 2, 2019, the Court held an evidentiary hearing on the loss amount. (See Doc. Nos. 274-76; 286-88.) At the hearing, the Government offered their five witnesses to support the loss valuation, namely, (1) FBI Special Agent Andrew Haugen; (2) Dr. Joseph Tarnowski, (3) Dr. Joseph Villafranca; (4) Dr. Chester Meyers, and (5) Dana Trexler. Defendants offered two expert witnesses: (1) Dr. Jeffrey Field, a scientific expert, and (2) Dr. David Blackburn, an economic expert. The testimony of each witness is summarized in turn.

FBI Special Agent Andrew Haugen testified about his role in the investigation and in the collection of evidence. (Doc. No. 286.) Agent Haugen testified that he executed search warrants for the personal email accounts of Defendants and their co-conspirators, and also

seized Defendant Xue's and Defendant Li's laptop computers, tablets, thumb drives, and cellphones. (Id. at 7-8.) After finding over 400 GSK documents[10] on Defendant Li's computer, Special Agent Haugen and GSK scientists worked together to identify potential trade secrets in those documents. (Id. at 16.) He described some documents, including GSK presentations that had been rebranded under Renopharma; Renopharma financial projections detailing exit strategies and stating that the company could be worth as much as $10 billion; Renopharma marketing materials touting the company's "advanced antibody design platform;" and an email from Defendant Li soliciting investment in the company. (Id. at 20-30.)

On cross-examination, defense counsel portrayed the internal Renopharma documents as puffery to encourage investment in the company by private investors and the Chinese government. Defense counsel noted—and Special Agent Haugen confirmed—that the Renopharma documents falsely claimed that a renowned scientist, Dr. Ronald Evans, was a consultant to the company; that the marketing materials overstated Defendant's Xue's credentials by falsely claiming she was the Chief Scientist at GSK; and falsely asserted that Renopharma had already developed six antibody drugs. (Id. at 33-45.) Agent Haugen also confirmed that Renopharma was not a successful business and, in fact, had lost nearly $400,000. (Id. at 83-84.) Defendant Xue's counsel pressed Agent Haugen on Xue's access to sensitive GSK material, noting that she could have stolen significantly more valuable information than what was taken. Agent Haugen confirmed that she had access to a massive trove of GSK documents. (Id. at 46.)

[10] In his testimony, Agent Haugen clarified, that "the exact number of individual unique documents was just over 200" because there were copies of documents. (Id. at 16.)

Agent Haugen also described the arrest and subsequent interrogation of Defendant Li at the San Diego Airport on January 5, 2016. (Id. at 90.) He confirmed that during this interview, Defendant Li explained that Renopharma was working on a PDL2 antibody, not a HER3 antibody, but that Renopharma included HER3 in marketing materials because HER3 was more well-known and would be more likely to generate investor interest. (Id. at 93-96.) Agent Haugen also testified that Defendant Li told him that Renopharma tried to avoid developing products that would be in conflict with GSK. (Id. at 91.)

The Government's second witness was Dr. Joseph Tarnowski, a Senior Vice President at GSK. (Id. at 106.) Dr. Tarnowksi was one of the scientists who examined the seized documents to discern potential GSK trade secrets. (Id. at 115.) He described key terminology, including a general explanation of a "platform," which he said was, a "thing that we developed within the company that can do multiple things. It serves as the foundation on which we can build other things on." (Id. at 113.) In other words, a platform provided GSK with a way to standardize the procedural development of a new variation of a product, rather than starting from the beginning each time. (Id. at 114.) In his review of the stolen data, Dr. Tarnowski testified that he found information pertaining to the three different GSK platforms noted above, i.e. the mAb, dAb, and ADC. (Id. at 117, 121.)

Dr. Tarnowski testified about the time and money GSK invested in developing the stolen data and examined two different categories of information. First, he testified that GSK invested more than $550 million to develop stolen information related to specific products, which did not include the value of the three platforms. (Id. at 133.) He explained that the stolen documents contained IND applications and other documents which "contained pretty detailed instructions on how to do something, how to make something." (Id. at 117.) He further stated

that although the stolen information included information about products no longer in production, including the HER3 antibody, the information remained valuable to the company because it could be used for research to improve other products and product production may resume again in the future. (Id. at 138.)

Second, Dr. Tarnowski detailed the value of GSK's three platforms. He testified that the monoclonal antibody ("mAb") platform took GSK nearly twenty years to develop. (Id. at 115.) He did not provide an approximate valuation of the mAb platform but explained that it takes GSK an average of twelve years and over 1,000 employees to develop each monoclonal antibody and that it can cost up to one billion dollars to do so, even with the benefit of its mAb platform. (Id. at 110-112.) Therefore, according to Dr. Tarnowski, Renopharma's access to the mAb platform would allow Defendants to save a substantial amount of time and money during its development of monoclonal antibodies. (Id. at 112.)

Dr. Tarnowski also testified that GSK purchased the domain antibody ("dAb") platform from a smaller biotech company, Domantis, for between four- to five-hundred million dollars. (Id. at 136.) He further stated that GSK paid several tens of millions of dollars to "licens[e] the [antibody drug conjugate ("ADC") platform] technology from Seattle Genetics." (Id. at 120.) He estimated that GSK had invested "about three billion [to] four billion" dollars in all the stolen information. (Id. at 137.)

The Government's third witness, Dr. Joseph Villafranca, the President of Biopharmaceutical Consultants, LLC, testified about the scope and value of the stolen documents detailing individual GSK products. (Doc. No. 287.) He testified that the cost of developing a monoclonal antibody is "estimated anywhere between one and two billion

dollars."[11] (Id. at 5.) He derived this number from the wide array of personnel involved, including biologists, chemists, engineers, and others, and the substantial cost of running research and production facilities. (Id.) He explained the potential for an unfinished product like HER3 to generate billions of dollars in revenue, if it was ever developed. (Id. at 7-8.) In sum, Dr. Villafranca testified that the value of the three platforms and potential drugs that could be manufactured using the platforms, as described in the misappropriated GSK documents, could be worth more than $550 million.[12] (Id. at 35.)

Dr. Villafranca also explained how the stolen information would benefit an upstart pharmaceutical company like Renopharma. He said that small pharmaceutical research companies face obstacles such as lack of expertise and funding, and a company like Renopharma therefore would benefit from the misappropriated GSK documents because they provide "recipes" to develop biopharmaceutical products. (Id. at 11.) The GSK platforms' recipes provide a roadmap,

> . . . from the beginning of the process all the way through to manufacture, to tests, to work with regulatory agencies, what are my specifications, what am I looking for, what -- how would I do this? [. . .]. A platform, to me, is a system. It's a system of steps to go from point A to point B or C, D, E, F. And in order to go through this complex process of discovering a drug to testing it,

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[11] On cross-examination, Dr. Villafranca's valuation of specific GSK products was challenged. Specifically, Dr. Villafranca was asked whether he was "aware that the molecules that [he has] talked about today all had patent applications before Renopharma was even formed." (Doc. No. 287 at 40.) After he stated that he was not aware, he was pressed on "how much would a company . . . pay for a for a sequence that was already the subject of a patent that's been applied for and filed?" (Id. at 41.) Dr. Villafranca responded that, "[w]e wouldn't pay anything" unless subsequent diligence rendered the patent inapplicable. (Id.)

[12] During cross-examination, Dr. Villafranca clarified that the documents themselves were not worth $550 million; rather, if Renopharma had used the information to develop drug products, then the information would be worth $550 million. (Doc. No. 287 at 37.)

> for example, in mice to then making it a human antibody, to then filing the IND,[13] to then setting up the clinical trial; this is a road. It's a road to the final end, which is commercialization.

(Id. at 12-13.) Thus, according to Dr. Villafranca, Renopharma would benefit from the stolen platform information, even if it did not intend to develop the same antibodies as GSK. (Id. at 19.)

The Government's fourth witness was Dr. Chester Meyers, an expert on patent applications. He was retained by the Government to compare the stolen GSK documents with GSK patent applications to confirm that the stolen documents did, in fact, contain trade secrets that had not been disclosed during the patent application process.[14] (Id. 67-68.) Broadly, he testified that the stolen documents contained trade secrets because they had more information

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[13] As noted, IND is an abbreviation for "Investigational New Drug." Dr. Tarnowski testified that these documents "describe[e] how you're going to make the product, how you're going to test it, how you're going to test the quality, and how you're going to test it in patients to see if it's safe and effective." (Id.)

[14] Dr. Meyers also opined on the importance of GSK's platform information. He explained that even if Renopharma was not researching a specific GSK antibody or target, the platform information would still be extremely useful because it has applications beyond GSK-specific research. Using a hypothetical example, he testified:

> A: If they [Renopharma] want to go onto antibody B, not IL7R but name an antibody target, they can have that made. And it's very easy to do and very inexpensive to do, that piece, and you insert that into your plasmid, and that's why it's a platform. The trade secret is that you -- you have developed a platform with plug-and-play pieces that allow you to make any antibody with that same plasmid.
>
> Q. So those documents would be useful in other applications?
>
> A. Yes, in other antibody applications, yes.

(Doc. No. 287 at 75.)

than disclosed on the patent applications, including "the level of detail for some of the manufacturing components," comparisons to competitor data, strategic decisions, and experimental animal study results. (Id. at 69.) He explained that although patents are open to the public, they merely contain general information; and therefore, the recipe or "specific commercial production machine" for a product would not be included. (Id. at 71.) Thus, according to Dr. Meyers, the fact that some stolen information related to GSK-filed patents did not destroy the non-public information's trade secret status. (Id.)

The Government's fifth witness was Dana Trexler, a forensic accountant. She was retained, as she described it, "to provide analysis and opinions as to indications of value of the information that was misappropriated related to GSK's trade secrets." (Id. at 110.) Using her background as a certified public accountant and forensic accountant, and based on the testimony of the four preceding witnesses, along with her interviews of Dr. John Baldoni and Dr. Narendra Bam—each Senior Vice Presidents at GSK—Trexler testified about the content of her 44-page report on the value of the stolen GSK trade secrets. (Id.) (see Gov't Ex. E at 1-2.) In her report, Trexler opined that the stolen information's "indication of value" was $1,072,576,000. (Gov't Ex. E at 3.)

Trexler testified that she analyzed the value of the stolen GSK trade secrets by dividing the information into three "buckets." (Doc. No. 287 at 110.) The first was GSK's cost to develop or acquire the various platform technology. (Id.) The second was GSK's cost to develop the specific products, molecules, and antibodies that Defendants are alleged to have misappropriated. (Id.) The third was the fair market value of the stolen information, and

specifically its value from Renopharma's perspective. (Id.) Trexler then added the value of each "bucket" to determine the total loss.[15] (See Gov't Ex. E at 3.)

Trexler testified about each of the three "buckets" in turn, starting with GSK's costs to develop or acquire the various platform technology. (Id. at 117.) She estimated that the mAb platform cost $370 million to develop. (Id. at 120.) Her estimate relied on the platform's development time (20 years), the total number of salaried scientists working on the platform (approximately 100), and their average annual salary (approximately $250,000), discounted over time and adjusted for inflation. (Id. at 119-120.) Next, she testified that the dAb platform was worth $451 million based on GSK's cost to purchase the platform from another company, Domantis, in 2007. (Id. at 121.) Similarly, Trexler valued the ADC platform at $17.7 million based on GSK's procurement cost, which in this case was the purchase price of the license from Seattle Genetics.[16] (Id. at 123-24.)

Second, Trexler testified about the value of specific products, molecules, and antibodies that Defendants are alleged to have misappropriated. She valued this second bucket at $33.9 million.[17] (Id. at 132.) Trexler testified that she reached this number by looking at the total

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[15] Since the misappropriated documents contain fragmented details of GSK products, Trexler testified that she collectively valued the stolen information instead of independently valuing each individual trade secret. This led her to focus her analysis on the stolen platform technologies and INDs, which could be more easily monetized and, in her view, better reflect "GSK's cost to develop or acquire the -- the platforms and the technology." (Doc. No. 287 at 131, 224.)

[16] Trexler's report has a slightly different valuation for the ADC Platform. Her report calculates its value as $17.7 million, not $17.9 million, as stated during the hearing. (Compare Doc. No. 287 at 124, with Gov't Ex. R at 3.)

[17] Trexler's report calculates the second bucket's value more precisely, estimating it at $33.96 million. (Gov't Ex. R at 3.)

cost of development, and then eliminating costs she did not feel could fairly be included in the development cost valuation. Her estimate began at $3 billion, which included "[t]he costs . . . of GSK employees who were directly assigned to work on [sixteen[18] pre-clinical drug products found within the stolen documents]." (Id. at 125.) That figure was then dramatically reduced to $67 million after excluding any cost for clinical trials and removing costs associated with the twelve stolen drug products that did not have an IND application. (Id. at 131.) Trexler explained that she removed costs for the non-IND products in the interest of fairness. She stated,

> And so I said look, to be fair, you know, I think there is value in some of these other -- other documents, but if there's not an IND, I am going to exclude those drugs from my calculation. I'm only going to look at those for which there was INDs because it gives me a stronger, you know, footing to say that they took -- they took information that was more robust.

(Id.) This left Trexler with four remaining misappropriated products to value: two monoclonal antibody drugs and two domain antibody drugs. (Id. at 132.) But according to Trexler, three of the remaining four products were subsequently excluded from the total. One domain antibody drug did not have any associated costs in GSK's records, and both monoclonal antibody drugs could potentially be covered under the first bucket's calculation of the mAb platform. (Id. at 132.) Thus, Trexler testified "that left me with 33.9 million, [which] is only the cost for the [sole remaining domain antibody drug.]" (Id.)

[18] Trexler testified that there were references to 18 different drug products in the misappropriated documents; however, two of the products had "no cost information in GSK's system" so they were omitted from the valuation. (Doc. No. 287 at 126.)

Third, Trexler testified that the fair market value of the stolen information, which she confirmed was "essentially, the intended gain," (id. at 136), totaled $200 million. (Gov't Ex. E at 3.) Trexler testified that she reached this figure by comparing the stolen data to relevant market transactions, many of which were referenced in Renopharma internal documents as aspirational benchmarks. (Doc. No. 287 at 136-37.) Apparently, there were three different methods Defendants intended to employ to monetize the stolen information. First, they considered collaboration and partnering agreements with larger pharmaceutical companies." (Id. at 137.) According to Trexler, Renopharma envisioned $200 to $400 million in revenue from this method, stemming from collaborating with a large pharmaceutical company and sharing in the benefits of a commercialized drug. (Id. at 140.) Second, "[t]hey considered entering into licensing deals where they would generate [ ] revenue by licensing . . . what they have." (Id. at 137.) Trexler testified that Renopharma anticipated $200 to $400 million from this method. (Id. at 140.) Third, "they were considering monetizing [ ] through transactions, whether they would sell a pre-clinical drug, sell their company, which might be comprised of more than one pre-clinical drug[; in other words,] they were looking at various exit strategies . . . to monetize what they ha[d]: the platforms, the drugs, et cetera." (Id.) Trexler explained that Renopharma had numerous exit strategies planned with various time horizons and anticipated valuations ranging from $100 million to $2 billion. (Id. at 142-43.) Trexler confirmed that she vetted all these figures against comparable market transactions and found them to be reasonable. (Id. at 152.)

Despite the significant valuations Renopharma included in their internal projections, Trexler explained that she kept with her conservative approach when evaluating the fair market value of the stolen information. She testified,

> So after looking at the information that's included in numerous Renopharma documents where they reference the 2[00-] to 400-million-dollar range, considering the various transactions that Renopharma considered to be comparable indicators of -- of value, it seemed reasonable to me that selecting the low end of the range of what the Defendants were putting out there as the minimum value that they thought they could derive was reasonable to include in my calculation. There were many other numbers that were significantly higher than that, and I think you could make an argument to go north of that. And again, this is just for one transaction. There could be multiple, but I -- I -- I tried to keep it conservative, at the low end of what the Defendants' expectations appear to be from their documents.

(Id. at 152-53.)

Summarizing, Trexler testified that "the value of the three platforms along with the cost of the drugs, plus the drug transfer, that all told, in [her] analysis, is more than 550 million dollars." (Id. at 153.)

During cross-examination, Defendant Xue's counsel questioned Trexler about her valuation. Counsel focused initially on the reasonableness of Trexler's findings:

> Q. And these market transactions identified by Renopharma in their materials seeking to get investments, they seemed reasonable, realistic to you?
>
> A. So as part of what I do is, when looking to assess value, oftentimes, it's what we refer to as the market approach. You would go out and look at market transactions that are comparable to the company or -- or the situation at hand. And when I looked at the transactions that they identified, obtained an understanding of the stage of development and the types of science that was being transferred, it appeared reasonable as to why they selected these transactions.
>
> Q. Any of these companies that were being acquired have five employees?
>
> A. I don't know whether they had five employees or not, and what – I'm not looking at what Renopharma did; I'm looking at

> what Renopharma was projecting that they would be able to do with the information that they have.
>
> Q. Any of these companies that were acquired have just two PhDs on staff?
>
> A. Well, again, I'm valuing the information that was taken and misappropriated, and I'm putting that in context with what Renopharma believed they would be able to do. And that -- they looked at it from a time period of one-and-a-half years up through ten years, and at ten years, they expected that the valuation would be closer to ten billion.

(Id. at 154-55.)

Next, Defendant Xue's counsel honed in on Trexler's understanding of her role in valuing the loss in this case.

> Q. Are you aware that the exercise in this case is the -- to determine the pecuniary loss suffered by GSK?
>
> A. I -- I mean, I think you're getting into some of the legalities. I understand that GSK's cost to develop is an acceptable way to measure the loss for theft of trade secrets.
>
> Q. Who do you understand that from; [Government counsel]?
>
> A. It's based on my discussion with counsel, and I did read the Federal Sentencing Guidelines at the time I did my report.

(Id. at 166.) Lastly, Defendant Xue's counsel questioned Trexler about her view of the importance of Defendants' use, or intended use, of the stolen information. According to Trexler, Defendants' intent or use of the information was irrelevant. In her opinion, the stolen information has an intrinsic value that is not impacted by Defendants' actions or intent. She testified as follows:

> Q. Are you aware that internal Renopharma documents show that Renopharma was working on drugs unrelated to anything that GSK was working on?

> A. I don't have a science background. I saw that they've referenced certain drugs. I mean, it –
>
> Q. Assuming this is true, would that be relevant, in any way, to your valuation of harm suffered by GSK?
>
> A. No, because what I'm looking at is the value of the information that they took, not what they did with it. I mean, if -- if I steal the Hope Diamond and I don't do anything with it and I lock it away, I've still stolen the Hope Diamond.
>
> Q. Well –
>
> A. There – there's value there.
>
> Q. Yeah. But there's only one Hope Diamond, right?
>
> A. Yes.
>
> Q. And if you take it, then the other owner no longer has it, right?
>
> A. That would be true.
>
> Q. And when you're talking about intellectual property, if someone takes intellectual property and never uses it, which is the evidence in this case, and Renopharma -- and GSK still has full access to it, it's nothing like taking the Hope Diamond from the owner because GSK still has all of its property that it can use, right?
>
> A. No. You're conflating two different theories. The -- the one theory you're talking about, you're – you're saying GSK doesn't have a loss because they still have access to the platforms. What I'm saying is there's value in what was taken. Whether or not the Defendants do anything with it, I'm looking at the value of what was taken, based on the cost of – GSK's cost to develop or acquire. It doesn't -- what -- what -- what Renopharma did or did not do with the information doesn't diminish the value of the information that was taken.

(Id. at 182-83.) Later, she reaffirmed her position:

> The -- the Hope -- the – I'm talking about the value of the Hope Diamond, the value of what was taken, and it doesn't change the value of what was taken if the Defendants don't use it or if they

> use it poorly. The value of what was taken remains static, and that's what we're talking about here. And -- and they were using the GSK information to attempt to raise funds. They were using and referencing GSK trade-secret information in their business plans in an attempt to get investment dollars.

(Id. at 194.) And, again, during cross-examination by Defendant Li's counsel, Trexler confirmed that Defendants' intent was irrelevant.

> Q. If the Judge were persuaded that my clients never intended to use that information for scientific purposes and had always intended to develop their own antibodies, would that affect your opinion?
>
> A. I mean, my opinion is what the value of the information that was taken was. I'm not valuing what the Defendants did with the information. I'm valuing what they took, based on GSK's cost to develop or acquire.

(Id. at 224-25.)

After the Government rested, Defendants called the first of their two expert witnesses, Dr. Jeffrey Field. (Doc. No. 288.) Dr. Field, who is an expert in molecular biology, testified that many of the misappropriated documents contain neither confidential information nor trade secrets because the information is publicly available. For example, he stated, "all of [GSK's mAb] platform is in the public literature." (Id. at 10.) He testified that "well, to put it bluntly, [the textbook Antibodies: A Laboratory Manual by Harlow and Lane, published in 1988] is the mAb platform." (Id. at 10-11.) He further testified that GSK's allegedly trade secret humanization process is detailed in the textbook "The Therapeutic Antibodies" by Zhiqianq An, copyrighted in 2008 (id. at 13), and GSK's allegedly trade secret molecular cloning process is described in the textbook "Molecular Cloning" by Michael Green and Joseph Sambrook, copyrighted in 1988. (Id. at 14.) In sum, Dr. Field asserted that the misappropriated documents

do not "contain anything materially different than the information in those books."[19] (Id. at 16.) Dr. Field also testified that although some of the stolen documents contained GSK trade secrets, he did not believe the stolen information was of any value to Defendants because Renopharma was working to develop monoclonal antibodies different from those being developed by GSK.[20] (Id. at 38-39.)

Next, Defendants' second expert witness, Dr. David Hart Blackburn, critiqued Trexler's proposed valuation. (Id. at 107.) He challenged Trexler's findings on three grounds.

First, he described her report as "vague" and argued that it wrongly calculated the development platforms' values by using the total development costs, rather than the development costs of trade secrets specific to GSK. (Id. at 112-113.) He stated,

> I understand there's a lot of companies out there that run -- have mAb platforms. So the secret sauce can't be the entire platform. The confidential information, the trade secrets, have to be something specific to GSK. If it's not specific to GSK, it can't be confidential GSK information. And Ms. Trexler's analysis is this

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[19] During cross-examination, the Government questioned Dr. Field's claim that certain GSK trade secrets are "in the books" and accessible to the public. (Doc. No. 288 at 58-59.) It further questioned that even if the textbooks provide standard information, the misappropriated documents still detail trade secret processes and protocols that are specific to GSK. (Id. at 61-62.) To that, Dr. Field responded:

> Well, it is the type of thing that's so trivial that you, like, wouldn't put it in a patent. I mean, when I wrote my papers on monoclonal antibodies I wouldn't put some details like that in it. It's just obvious to anyone skilled in the art that you would do the experiment that way.

(Id. at 62.)

[20] Defendants note that Renopharma was only researching the PDL-2 and PD-1 targets and its own OX-40 antibody, all of which were unrelated to any GSK products. (Doc. No. 292 at 10.)

> [sic] is the cost of developing everything, not the stuff that's specific to GSK.

(Id. at 139-40.)

Second, Dr. Blackburn testified that Trexler's valuation methodology—the "indication of value"—is inappropriate because it does not assess actual harm. (Id. at 118.) He explained that the measure of harm is the proper method to use in this case because whether GSK was deprived of economic opportunity and whether the marketplace was changed as a result of the misappropriation is the critical inquiry.[21] (Id. at 111, 119.) Dr. Blackburn testified that in this case, no evidence supports that GSK was deprived of any economic opportunity or ability to use their information, "and nothing was done to change the market in any way that might affect them." (Id. at 119.) Thus, there was no harm to GSK. (Id. at 126-127.)

Third, Dr. Blackburn testified that even if Trexler's trade secret valuation was appropriate, she erred by adding the valuation methods—i.e., the three "buckets"—together because they reflect alternative valuation methods, not additive methods. (Id. at 125-26.) He explained,

> Q. … Even if [the trade secret valuations] were appropriate, would it be appropriate to add those two components?
>
> A. No. It wouldn't be appropriate. I mean, they're two separate methodologies for valuation . . . They're separate approaches. This is one way to figure out value. This is another way to figure out value. But they're not additive. Even if you believe the numbers, they're not additive.
>
> Q. So when you say separate or not, is that, in other words, they're alternatives, correct?

[21] For example, Dr. Blackburn characterized Trexler's report as flawed because it "doesn't look at the world as it is versus what the world would have looked like if the theft hadn't occurred." (Doc. No. 288 at 123.)

> A. That's correct. They're alternatives.
>
> Q. For a valuation, correct?
>
> A. That's correct.
>
> Q. And in your opinion it would never be appropriate to add those alternatives to find out what the harm is, correct? It's either one or other.
>
> A. Well, I mean, I wouldn't say that it's never appropriate. It's certainly not appropriate in this situation, because she's valuing the same things.

(Id. at 125-26.) In closing, Dr. Blackburn testified that, in his expert opinion, there was no loss in this case because there was no evidence that the pre-theft value of the stolen information was affected in any way by Defendants' actions. (Id. at 126-28.)

C. Post-Hearing Memorandums

On July 26, 2019, both the Government and Defendants filed post-hearing memorandums. (Doc. No. 290, 292.) In each, the parties summarized their arguments.

In its Memorandum, the Government reaffirmed its position that the value of the stolen information exceeded $550 million under the Federal Sentencing Guidelines because "[b]y stealing the GSK information, Renopharma obtained billions of dollars' worth of research and avoided all of GSK's developmental costs to develop the stolen platforms and products." (Doc. No. 290 at 6.) The Government also disputed Defendants' expert witnesses' testimony, characterizing Dr. Field's assertion that GSK's trade secrets in the stolen documents could be found in a series of textbooks as "absurd" (id. at 18) and argued that Dr. Blackburn advocated for the wrong legal standard to determine loss (id. at 23). According to the Government, the cost of development is the most appropriate method to calculate loss because trade secrets are inherently difficult to value. (Id.)

Defendants, in their Memorandum, asserted, among other things, that the loss in this case should be $0 because the Government did not prove that GSK suffered any actual or intended losses. Defendants contended there is no actual loss because the Government adduced no evidence at the hearing that "GSK lost (1) any economic opportunities, (2) the ability to use its trade secret and confidential information for research and/or profit, and (3) market share on any of its products." (Id. at 2.) Defendants asserted that the Government did not prove intended loss because it produced no evidence that Defendants intended to harm GSK, which they argued is a necessary element for an intended loss sentencing enhancement. (Id. at 33-37.)

III. ANALYSIS

A. United States Sentencing Guidelines

Congress has directed federal courts to impose sentences that are "sufficient, but not greater than necessary" to achieve the purposes of sentencing. 18 U.S.C. § 3553(a). As explained by Congress, a just and appropriate sentence should reflect the seriousness of the offense, promote respect for the law, provide just punishment for the offense, afford adequate deterrence to criminal conduct, protect the public from further crimes of the defendant, and provide the defendant with needed educational or vocational training, medical care, or other correctional treatment in the most effective manner. 18 U.S.C. § 3553(a)(2). In determining the sentence to be imposed, a court must consider the advisory United States Sentencing Commission's Sentencing Guidelines and relevant policy statements in the Guidelines. 18 U.S.C. § 3553(a)(4)-(5).

The Guidelines serve as the initial benchmark in every sentencing proceeding and "reflect a rough approximation of sentences that might achieve § 3553(a)'s objectives." Gall v. United States, 552 U.S. 38, 39 (2007); United States v. Rita, 551 U.S. 338, 350 (2007). Thus,

determining a proper sentence begins with calculating the Sentencing Guideline range. Gall, 552 U.S. at 39. To calculate the appropriate Guideline range, a court must determine a defendant's adjusted Offense Level and Criminal History Category. Taken together, the Guidelines yield an advisory sentencing guideline range for a court to consider before pronouncing a sentence.

Defendants pled guilty to conspiracy to steal trade secrets, in violation of 18 U.S.C. § 1832(a)(5). (Doc. Nos. 234-35.) Section 2X1.1 of the Sentencing Guidelines dictates the offense level calculation for a conspiracy offense. U.S.S.G. § 2X1.1. Relevant here, subsection (a) states that the base offense level for conspiracy is "[t]he base offense level from the guideline for the substantive offense . . .[,]" provided that the conspiracy is not expressly covered by another offense guideline section. U.S.S.G. § 2X1.1(a). As a result, and the parties agree, the Court must turn to the guideline for a theft offense, the substantive offense that was the object of the conspiracy in this case.

B. Offense Level Enhancement for Loss Pursuant to Section 2B1.1 of the Sentencing Guidelines

Section 2B1.1 of the Sentencing Guidelines dictates the offense level calculation for crimes involving theft of stolen property. Under this section, the offense level for theft is affected by the value of the loss caused by the defendant's criminal conduct. Subsection (a) provides the base offense level, which in this case is 6. Subsection (b) includes a series of increasing offense level enhancements based on certain, offense-specific characteristics, including an adjustment for the dollar amount of loss attributable to a defendant's theft.[22] The

[22] Under the Sentencing Guidelines' approach to economic crimes, the amount of financial loss attributable to a defendant's crime serves as a proxy for "the seriousness of the offense

enhancements range from a 2-level increase for a loss amount between $6,500 and $15,000, to a 30-level increase for a loss in excess of $550,000,000. U.S.S.G. § 2B1.1(b)(1).[23]

Importantly, Section 2B1.1 of the Guidelines does not require a loss calculation greater than zero. See United States v. Free, 839 F.3d 308, 323 (3d Cir. 2016). Instead, "'[t]he loss determination is a special offense characteristic that increases the guidelines offense level' through 'bonus punishment points, which express a reasonable estimation of the victim's financial loss.'" Id. (quoting United States v. Pu, 814 F.3d 818, 828-29 (7th Cir. 2016)). Thus, "the government is not entitled to a punitive loss calculation, even in cases involving fraud, absent evidence of actual or intended pecuniary loss." Free, 839 F.3d at 323. The same reasoning would apply to a case involving theft.

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and the defendant's relative culpability." U.S.S.G. § 2B1.1 app. n. Background; United States v. Campbell, 765 F.3d 1291, 1301 (11th Cir. 2014).

[23] In Section 2B1.1 of the Sentencing Guidelines, the only other subsection referring to misappropriation of trade secrets is (b)(14), which provides:

> (14) (Apply the greater) If the offense involved misappropriation of a trade secret and the defendant knew or intended—
>
> (A) that the trade secret would be transported or transmitted out of the United States, increase by 2 levels; or
>
> (B) that the offense would benefit a foreign government, foreign instrumentality, or foreign agent, increase by 4 levels.
>
> If subparagraph (B) applies and the resulting offense level is less than level 14, increase to level 14.

U.S.S.G. § 2B1.1(b)(14). This subsection, however, does not apply to the calculation of the amount of loss.

In the Third Circuit, courts "employ a burden-shifting framework to establish that [a loss] enhancement applies." United States v. Diallo, 710 F.3d 147, 151 (3d Cir. 2013). "[T]he government bears the burden of establishing the amount of loss for purposes of sentencing by a preponderance of the evidence." United States v. Free, 714 Fed. App'x. 144, 146 (3d Cir. 2017) (quoting Free, 839 F.3d at 319). "[T]hough the government bears the burden of proof in guidelines cases, the burden of production may shift to the defendant once the government presents prima facie evidence of a given loss figure." Diallo, 710 F.3d at 151 (quoting United States v. Geevers, 226 F.3d 186, 188 (3d Cir. 2000)). "However, the government always bears the burden of proving by a preponderance of the evidence that the facts support a sentencing enhancement, and 'the defendant does not have to prove the negative to avoid the enhanced sentence.'" Diallo, 710 F.3d at 151 (quoting United States v. Evans, 155 F.3d 245, 253 (3d Cir. 1998)).

In determining whether the Government has presented prima facie evidence of the amount of loss (i.e., the evidence sufficient to establish the amount of loss, if not rebutted), a district court should consult the Sentencing Guidelines' commentary, which is binding. See Geevers, 226 F.3d at 190 ("The commentary to the guidelines . . . is binding") (internal citations omitted). Here, Application Note 3 to Section 2B1.1 of the Guidelines "applies to the determination of loss under subsection (b)(1)," and provides as follows:

> (A) General Rule. Subject to the exclusions in subdivision (D),[24] loss is the greater of actual loss or intended loss.

[24] The exclusions in Subsection D, not included in the loss calculations, are:

> (i) Interest of any kind, finance charges, late fees, penalties, amounts based on an agreed-upon return or rate of return, or other similar costs.

(i) Actual Loss. "Actual loss" means the reasonably foreseeable pecuniary harm that resulted from the offense.

(ii) Intended Loss. "Intended loss" (I) means the pecuniary harm that the defendant purposely sought to inflict; and (II) includes intended pecuniary harm that would have been impossible or unlikely to occur (e.g., as in a government sting operation, or an insurance fraud in which the claim exceeded the insured value).[25]

(iii) Pecuniary Harm. "Pecuniary harm" means harm[26] that is monetary or that otherwise is readily measurable in money. Accordingly, pecuniary harm does not include emotional distress, harm to reputation, or other non-economic harm.

(iv) Reasonably Foreseeable Pecuniary Harm. For purposes of this guideline, "reasonably foreseeable pecuniary harm" means pecuniary harm that the defendant knew or, under the circumstances, reasonably should have known, was a potential result of the offense.[27]

(ii) Costs to the government of, and costs incurred by victims primarily to aid the government in, the prosecution and criminal investigation of an offense.

U.S.S.G. § 2B1.1, app. n.3(D). These exclusions are not at issue here.

[25] Clause II of the definition of intended loss does not apply here.

[26] The Cambridge Dictionary defines "harm" as "physical or other injury or damage." Harm, CAMBRIDGE DICTIONARY, www.dictionary.cambridge.org/us/dictionary/english/harm (last visited August 31, 2020).

[27] Reasonably Foreseeable Pecuniary Harm is not relevant to the instant matter because this definition only applies to actual loss. The Government's loss figure is based on intended loss.

> (B) Gain. The court shall use the gain that resulted from the offense as an alternative measure of loss only if there is a loss but it reasonably cannot be determined.[28]
>
> (C) Estimation of Loss. The court need only make a reasonable estimate of the loss. The sentencing judge is in a unique position to assess the evidence and estimate the loss based upon that evidence. For this reason, the court's loss determination is entitled to appropriate deference.
>
> The estimate of the loss shall be based on available information, taking into account, as appropriate and practicable under the circumstances, factors such as the following:
>
> (i) The fair market value of the property unlawfully taken, copied, or destroyed; or, if the fair market value is impracticable to determine or inadequately measures the harm, the cost to the victim of replacing that property.
>
> (ii) In the case of proprietary information (e.g., trade secrets), the cost of developing that information or the reduction in the value of that information that resulted from the offense.[29]

U.S.S.G. § 2B1.1, app. n.3(A)-(C)(i),(ii). In this case, only "intended loss" is relevant.[30] (See Doc. No. 290 at 12-13) ("loss is defined as "the greater of actual loss or intended loss. This is an intended loss case.") (internal citations omitted) (emphasis in original).

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[28] In the instant case, since there was no actual loss to GSK that resulted from the offense, gain is not used as an alternative measure. In any event, there was no actual gain to Defendants. Their venture, Renopharma, lost nearly $400,000.

[29] Application Note 3(C) includes other ways to estimate the loss, but the Government's relies only on the fair market value and the cost of development as the basis for its loss valuation.

[30] The Government made no effort to show that GSK suffered any actual loss and, instead, has focused entirely on intended loss. (See Doc. No. 290 at 12-13) ("loss is defined as "the greater of actual loss or intended loss. This is an intended loss case.") (internal citations omitted) (emphasis in original). At the hearing, Government witnesses on loss did not provide any testimony on pecuniary loss or harm. For example, Dana Trexler, a valuation

The Guideline definition of intended loss includes the mens rea requirement that the defendant "purposely sought to inflict" pecuniary harm on the victim. Therefore, to establish a

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witness for the Government, testified, "I did not calculate GSK's [actual] loss." (See Doc. No. 287 at 168.)

Dr. Joseph Tarnowski, a Senior Vice President at GSK, also testified there was no actual pecuniary harm to GSK. He said as follows:

> Q. And so GSK didn't suffer a pecuniary loss as a result of this – well, let me ask you this: there were no sales you saw that were conducted by Renopharma for any of these products, correct?
>
> A. Not to my knowledge, but I didn't follow Renopharma formally, so –
>
> Q. Have you received any information from the Government or from any other source that Renopharma was cutting into GSK's market share in any way?
>
> A. No.
>
> Q. So GSK has not lost any money in sales to Renopharma?
>
> A. No.
>
> [. . .]
>
> Q. So . . . GSK didn't suffer a pecuniary loss as a result of [the fraud], correct?
>
> A. No.

(Doc. No. 286 at 105, 148-149.) In addition, on the date Defendants were charged with theft of trade secrets, GSK issued a press release that stated, "we do not believe the breach has had any material impact on the company's business or R&D activity." Taunya English, Scientists Charged with Attempt to Steal Trade Secrets from GlaxoSmithKline, WHYY, Jan. 21, 2016, https://whyy.org/articles/scientists-charged-with-attempt-to-steal-trade-secrets-from-glaxosmithkline/. Since then, GSK has not modified its statement nor notified its shareholders of any material loss in connection with the theft. (Doc. No. 286 at 151.) For this reason, among others, the actual loss in this case is $0.

prima facie case of intended loss, the Government must show that a defendant had the requisite subjective intent. In other words, the Government must establish that a defendant "purposely sought to inflict" a specific monetary amount of loss on the victim. See U.S.S.G. § 2B1.1, app. n.3(A)(ii). Thus, the "'[i]ntended loss analysis, as the name suggests, turns upon how much loss the defendant actually intended to impose' on the victim, regardless of whether the loss actually materialized or was even possible." United States v. Pu, 814 F.3d 818, 824 (7th Cir. 2016) (quoting United States v. Higgins, 270 F.3d 1070, 1075 (7th Cir. 2001)); see also United States v. Middlebrook, 553 F.3d 572, 578 (7th Cir. 2009) ("[T]he true measure of intended loss [is] in the mind of the defendant.").

The Sentencing Guidelines did not always require consideration of a defendant's subjective intent. Before November 2015, Application Note 3(A) defined intended loss as "the pecuniary harm that was intended to result from the offense[.]" U.S.S.C., Amendments to the Sentencing Guidelines (Apr. 30, 2015), at 24-25 (emphasis added). But courts felt that this definition was ambiguous on whether it required a subjective or an objective finding of the defendant's intent.[31] In response, the Sentencing Commission revised the definition of

[31] Compare United States v. Confredo, 528 F.3d 143, 152 (2d Cir. 2008) (remanding for consideration of whether defendant had "proven a subjective intent to cause a loss of less than the aggregate amount" of fraudulent loans); United States v. Diallo, 710 F.3d 147, 153 (3d Cir. 2013) ("It is error for a district court simply to equate potential loss and intended loss without deeper analysis."); United States v. Sanders, 343 F.3d 511, 527 (5th Cir. 2003) ("our case law requires the government prove by a preponderance of the evidence that the defendant had the subjective intent to cause the loss that is used to calculate his offense level"); and United States v. Manatau, 647 F.3d 1048 (10th Cir. 2011) ("We hold that 'intended loss' means a loss the defendant purposely sought to inflict. 'Intended loss' does not mean a loss that the defendant merely knew would result from his scheme or a loss he might have possibly and potentially contemplated."); with United States v. Innarelli, 524 F.3d 286, 291 (1st Cir. 2008) ("we focus our loss inquiry for purposes of determining a defendant's offense level on the objectively reasonable expectation of a person in his

"intended loss" to "the pecuniary harm that the defendant purposely sought to inflict[,]" which is the current version. See U.S.S.G. App. C, amend. 792 (effect. Nov. 1, 2015) (emphasis added).[32]

The Sentencing Commission's rationale for the amendment is instructive. It reads, in part:

> The amendment adopts the approach taken by the Tenth Circuit [in United States v. Manatau] by revising the commentary in Application Note 3(A)(ii) to provide that intended loss means the pecuniary harm that "the defendant purposely sought to inflict." [647 F.3d 1048 (10th Cir. 2011).] The amendment reflects the Commission's continued belief that intended loss is an important factor in economic crime offenses, but also recognizes that sentencing enhancements predicated on intended loss, rather than losses that have actually accrued, should focus more specifically on the defendant's culpability.

U.S.S.G. App. C, amend. 792 (effect. Nov. 1, 2015).

In United States v. Manatau, the defendant engaged in a scheme where he stole "convenience checks" (checks issued by a credit card company) which allowed him to write—and cash—a check against the cardholder's line of credit. 647 F.3d at 1049. In some instances, the defendant knew the cardholder's credit limit, in others, he did not. Id. The defendant ultimately pled guilty and, at sentencing, the Government argued that the intended loss under

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position at the time he perpetrated the fraud, not on his subjective intentions or hopes"); and United States v. Lane, 323 F.3d 568, 590 (7th Cir. 2003) ("The determination of intended loss under the Sentencing Guidelines therefore focuses on the conduct of the defendant and the objective financial risk to victims caused by that conduct").

[32] This Court has reviewed all Amendments to Section 2B1.1 of the United States Sentencing Guidelines since the date of the offense in this case and there have been no intervening changes to the Sentencing Guidelines concerning intended loss that, if applied, would be to Defendants' detriment. See U.S.S.G., Historical Note, amends. 745, 747, 749, 761, 771-72, 777, 791-92, 806, 813. Therefore, no ex post facto issues related to loss are present.

the Sentencing Guidelines was the sum of the credit limit of all the stolen convenience checks. Defendant objected, arguing that, as a legal matter, the district court had to consider his mens rea when determining the intended loss and that he did not intend to reach the credit limit on some of the stolen checks because he did not know their credit limit. Id. at 1049-50. The district court applied the Government's suggested method and the defendant appealed. Id. at 1049.

On appeal, now- Justice Neil Gorsuch, then sitting on the United States Court of Appeals for the Tenth Circuit, reversed the district court and explained that intended loss for purposes of the Sentencing Guidelines "means a loss the defendant purposefully sought to inflict." 647 F.3d at 1050. As then-Judge Gorsuch explained, "an inquiry into a defendant's mens rea is required when determining his intended loss," and the mens rea standard is substantial. Id. at 1049. Intent, for purposes of finding intended loss, requires more than knowledge (i.e., awareness that a result is a practical certainty of the conduct); instead, intent requires a finding that the defendant had as his conscious object to cause the victim to sustain the loss. See id. at 1050. As a result, on remand the district court was instructed to examine what losses the defendant had intended based on his mental state. Id. at 1056.

To be sure, Manatau and the Guidelines do not require a proverbial "smoking gun" statement evidencing a defendant's subjective intent. Instead, as then-Judge Gorsuch explained, "[o]f course, in answering [what losses the defendant intended] the court is free . . . to make reasonable inferences about the defendant's mental state from the available facts." Id. This approach also seems to comport with current Third Circuit precedent. See United States v. Free, 714 Fed. App'x 144, 147 (3d Cir. 2017) ("A district court can infer the loss that a

defendant intended to inflict on a victim from the defendant's conduct, and the nature of the crime that the defendant sought to commit.").

The Guidelines provide a court with several different methods to calculate loss. As noted, Application Note 3(C) states that "[t]he estimate of the loss shall be based on available information, taking into account, as appropriate and practicable under the circumstances," factors including the "fair market value of the property unlawfully taken" or "[i]n the case of proprietary information (e.g., trade secrets), the cost of developing that information or the reduction in the value of that information that resulted from the offense." U.S.S.G. § 2B1.1, app. n.3(C)(i), (ii). In addition, since "[t]he sentencing judge is in a unique position to assess the evidence and estimate the loss based upon that evidence . . . the court's loss determination is entitled to appropriate deference." Id. app. n.3(C).

But fair market value or cost of development can contribute to the estimate of the loss calculation only when the factor is "appropriate and practicable under the circumstances." Id. app. n.3(C). Consequently, these figures must be buttressed by evidence the defendant purposefully sought to cause the victim to suffer a loss equal to the fair market value or development cost. See United States v. Pu, 814 F.3d 818, 826 (7th Cir. 2016) (cited with approval in United States v. Free, 839 F.3d 308 (3d Cir. 2016)). Without evidence showing a defendant intended his victim to suffer such a loss, either directly or by reasonable inference, the Government does not make out a prima facie case or meet its burden of proving the same by a preponderance of the evidence, and use of development cost and fair market value to determine intended loss is not appropriate.

C. Loss Pursuant to Section 2B1.1 of the Sentencing Guidelines is $0

The Government has failed to meet its burden to prove intended loss in this case because it did not show by a preponderance of the evidence that its suggested loss figure was one Defendants purposefully sought to inflict upon GSK. As a result, while the Government produced evidence of the fair market value and development cost of the stolen information, it failed to establish that Defendants purposefully sought to inflict that amount of harm upon GSK. This critical error was fatal to the Government's position.

Given the facts in this case, the reasoning employed by the Seventh Circuit Court of Appeals in United States v. Pu is instructive. 814 F.3d 818 (7th Cir. 2016). There, the defendant, a quantitative finance professional, worked for two financial institutions that traded stock and other assets. Id. at 821. While working at each company, he copied proprietary software from his employer's computer system to personal storage devices. Id. at 822. The software allowed the institutions to execute strategic trades at high speeds and were company trade secrets. Id. The defendant used the data to conduct personal computerized stock market trades. Id. at 821. But despite the benefit of the data, he lost $40,000. Id. After being charged with nine counts of wire fraud, four counts of unlawful transmission of trade secrets, six counts of unlawful possession of trade secrets, three counts of unauthorized access of a protected computer, and one count of obstruction of justice, he pled guilty to one count of unlawful transmission of a trade secret and one count of unlawful possession of a trade secret. Id. at 822.

At sentencing the parties agreed there was no actual loss but disputed intended loss. The defendant argued that there was no intended loss because the Government had not presented any direct evidence of intent. Id. at 827. The Government contended that the intended loss was approximately $12 million, which represented the cost to develop the trade secrets the defendant

illegally obtained. Id. The $12 million figure was based upon a Government report that outlined the development costs attributable to each stolen trade secret. Id. According to the Government, development costs were an appropriate measure of intended loss because they represented costs the defendant "avoided by stealing . . . rather than creating [the software] on his own." Id. at 825. The district court adopted the Government's proposed calculation of $12 million, finding that the financial institutions' research and development costs were a suitable proxy for intended loss. Id.

On appeal, the Seventh Circuit Court of Appeals reversed and held that the cost of development of the trade secrets is an appropriate measure of intended loss only if the record supports a finding that the defendant intended to cause a loss to the victims that equaled the cost of development. Id. at 826. The Seventh Circuit's analysis on the use of development costs as a proxy for intended loss in a theft of trade secrets prosecution is especially apt. It reasoned, in part:

> We do not doubt that the cost of development of the trade secrets was an easy figure to use when making the intended loss calculation. The guidelines suggest that the cost of development is the metric to use to estimate loss in a trade secrets case. But the real question is whether the government proved by a preponderance of the evidence that the cost of development of the trade secrets was the correct loss figure. To answer this, we must determine whether the record supports a finding that it was more likely than not that [the defendant] intended to cause a loss to the victims that equaled the cost of development. We conclude that it does not.
>
> [. . .]
>
> It seems that the … district court simply looked at the evidence and determined that an intended loss amount was required because there was no actual loss. Then, because the guidelines state that the court may estimate loss in a trade secrets case by considering the value of the trade secrets, they simply stated the

> trade secrets' purported value was the intended loss amount[.] … The guidelines state that in a trade secrets case, the cost of developing the information should be a factor taken into account to estimate the loss amount when the factor is "appropriate and practicable under the circumstances." Without evidence of [the defendant's] intent to cause the victims to suffer a loss equal to the cost of development, the district court's use of the cost of development to determine the intended loss amount was not appropriate.

(Id.) (internal citations omitted.)

In the instant case, the Government attempted to go a step beyond Pu by arguing that Defendants' intended gain, as reflected in their marketing brochures, business plans, and the letter from Defendant Li, establishes the necessary intent for showing intended loss. Thus, instead of relying entirely on the stolen information's alleged fair market value and development cost as a proxy for intended loss, the Government attempted to prove both elements: value and intent. To prove the first, the Government retained Dana Trexler. She pegged the total value at $1,072,576,000. To prove the second, the Government, as it describes in its own words, "examine[d] the [D]efendants' subjective expectation[.]" (Doc. No. 290 at 13.)

But the Government's examination of Defendants' subjective expectation considered the wrong kind of intent. Rather than evaluating Defendants' intent to harm GSK, the Government considered only Defendants' intended gain, perhaps because the Government mistakenly believed that intended gain was a suitable proxy for intended harm. It appears that the Government considered intended gain a suitable proxy for intended harm because it claimed that its "best evidence of intended loss is the [D]efendants' own financial statements which

outlined their intent."[33] (Doc. No. 290 at 14.) Based on those statements, the Government averred that Defendants believed they could resell the stolen information for as much as $2 billion; that sales of comparable monoclonal antibody netted between $200 to $400 million; and that Defendants' estimated that an initial public offering of Renopharma could generate more than $10 billion. (Doc. No. 290 at 12; Gov't Ex. R.) Notably, all of these figures relate to Defendants' belief about potential revenue—i.e., the intended gain—they could generate by using the stolen information.

In some respects, the Government's conflation of intended gain and intended loss is understandable because Third Circuit precedent allows a court to infer a defendant's intent to harm its victim from intended gain in certain limited circumstances. This can occur in a case where an underlying fraud involves the theft of money. See e.g. United States v. Geevers, 226 F.3d 186, 193 (3d Cir. 2000) ("We therefore must resolve the question whether a reasonable inference may be drawn that a defendant in Geevers's position intends to cause the full loss of the face value of his false checks. We hold that such an inference may be made."). When money is stolen, the Third Circuit has reasoned that a court may make the inference that a defendant intends to obtain the full benefit of his illegal scheme, and conversely, intends his victim to sustain the full amount of the corresponding loss. See id.; United States v. Diallo, 710 F.3d 147, 151-52 (3d Cir. 2013) (explaining that the Government may make its prima facie case based on the reasonable inference that a defendant intended to cause the full loss of the face value of fraudulent checks).

[33] The documents the Government refers to as "financial statements" are merely advertising and marketing materials. They are not "financial statements" in an accounting sense.

But that reasoning no longer holds true when applied to trade secrets, which is the object of the underlying theft in this case. When money is stolen, the property the thief obtains will necessarily be lost by the victim, and therefore an inference may be made that the thief's intended gain is the same as the thief's intended harm to the victim. For example, if Adam intends to steal $10 from Beth, he intends to gain $10 and also intends Beth to lose $10. By contrast, a trade secret theft, like the one in this case, may permit a thief to profit without an equal and opposite loss to the victim. This is true because the victim of a trade secret theft may not lose the stolen property. The theft does not deprive the victim of their idea; the victim can still use the information in exactly the same manner as it could before the theft – the only change to their pre-theft position is the loss of their right to the exclusive access to their proprietary information. Put simply, intended gain is not the same as intended harm in a theft of trade secrets prosecution because the thief's gain is not the inverse of the victim's loss, as is the case when money is stolen. For this reason, the Court cannot infer that Defendants intended to harm GSK simply because they sought to gain from the theft of GSK's trade secrets.

Thus, the Government's self-described "best evidence of intended loss"—Defendant's "financial statements"—have little bearing on determining intended loss because they do not support an inference that Defendants intended to harm GSK; instead they merely show Defendants expectations from the theft. Moreover, these documents hardly show what the Government claims. A review reveals that "financial statement" is not an apt description of either. The documents are PowerPoint presentations – one for recruiting employees and another for soliciting investments in Renopharma. While each document contains some reference to financial projections, when considered in the context of the purpose of each presentation, the financial information is not convincing evidence of a realistic expectation of gain. It is not

surprising that recruiting and investment presentations about Renopharma would have a rosy outlook on the company's value or growth prospects.

In addition, the financial figures in these documents are meant to attract attention. It is unrealistic to assume that a young pharmaceutical venture with two PhDs and five total employees would be worth, at a minimum, $200 million dollars, and as much as $2.2 billion. While Trexler testified that this figure was reasonable based on comparable market transactions, she did not testify that these transactions involved companies of a similar size and stature as Renopharma. Further, even if Trexler had testified that the comparable market transactions involved comparable companies, the Government's loss figure would still be inappropriate because relying upon what is essentially advertising brochures to determine the fair market value of stolen information is not an appropriate and practicable way to estimate loss. Relying on such brochures is not a fitting or sensible method to value a product or company, given the magnitude of the loss figure.

Nor does any of the Government's other evidence lead to a reasonable inference that the object of Defendants' theft was to harm GSK. The closest the Government comes is an email sent by Defendant Li to a third party, in which Li solicits investment in Renopharma. In that email, Defendant Li states,

> [W]e have several developed and validated humanized antibodies targeting a certain important target, which is ready for animal experiments. It's a fast way to produce a "real" drug in China. If you know a big enough pharmaceutical company which is capable to throw a big chunk of money in R&D and willing to buy such half-ready drug, could you please introduce to me and we will consult with them.

(Doc. No. 270 at 7.)

The Government uses this email to show intended gain—which, as the Court has already explained, provides little support to its prima facie case—but even if the Court construes the Government's argument liberally, intent to harm cannot be inferred because the Government did not show that it was more likely than not that Defendants were shopping a GSK-developed product, rather than their own, independent creation, or simply engaging in puffery to solicit investment, which appears to have been Renopharma's modus operandi. Further, even if such a showing had been made, the Government provided no evidence of how that sale would have harmed GSK. It has not offered any evidence about a potential downturn in market-share or lost profits that would have resulted from the conversion.

In sum, no evidence was presented by the Government that Defendants' purpose or goal was to harm GSK, and even GSK has conceded it was not harmed. Thus, harm to GSK was not the conscious object of Defendants.

None of this is to say that the stolen information was worthless. It clear that GSK invested considerable resources to develop the misappropriated information. But despite that fact, the law places the burden on the Government to prove the elements necessary for an offense-level enhancement for loss. This requires evidence of both value and purposeful intent, and the Government failed to carry its burden to prove the latter. For this reason, the loss amount for Sentencing Guideline purposes is $0.[34]

[34] Even if the Government had established a prima facie case, Defendants presented sufficient evidence to rebut the Government's proposed valuation. In this regard, the credibility of Defendants' expert witnesses, Dr. Field and Dr. Blackburn, overcame the Government's presentation. Dr. Field established that much of the stolen information was not trade secret information because it was publicly available and, to the extent some of the stolen information included trade secrets, credibly explained that that information was of no value to Defendants because it concerned drugs that Defendants did not intend to develop. Dr.

IV. CONCLUSION

Based on the foregoing, the Court concludes that the amount of loss in this case is $0. Accordingly, at sentencing, no specific offense level enhancement under Section 2B1.1(b)(1) of the United States Sentencing Guidelines will be used to raise Defendants' offense level. An appropriate Order follows.

Blackburn effectively rebutted the Government's expert's valuation methodology. His explanation that the expert erred by valuing the total development cost of all stolen information, rather than the development cost of only the trade secret information, and that the expert erred by adding the three "buckets" together was convincing and sensible. His critique of the expert's additive valuation method was especially compelling, as it proved that by adding the three "buckets" the methodology effectively tripled any loss figure. This obvious inflation undercut the methodology's logic.